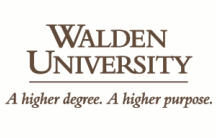

2019

The Effect of Maternity Care Practices on the Duration of Breastfeeding

Lisette Rodriguez
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral dissertation by

Lisette Rodriguez

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Katie Callahan, Committee Chairperson, Public Health Faculty
Dr. Loretta Cain, Committee Member, Public Health Faculty
Dr. Amy Thompson, University Reviewer, Public Health Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2019

Abstract

The Effect of Maternity Care Practices on the Duration of Breastfeeding

by

Lisette Rodriguez

BS, University of Miami, 2012

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

February 2019

Abstract

The natural practice of breastfeeding has been strongly noted as one of the most cost-effective, health promoting, disease-prevention strategies of the 21st century. Although primary health organizations recommend exclusive breastfeeding for the first 6 months of life with added complementary foods and continued breastfeeding up to 2 years of age or longer, many mothers do not breastfeed their infants for the recommendation length of time. Applied policies and health practices, such as those described under the 10 Steps to Successful Breastfeeding and The International Code of Marketing of Breast Milk Substitutes, have been noted as contributing factors that can considerably impact the manner which women choose to feed their infants. A cross-sectional methodology assessed associations between maternity health practices and breastfeeding duration among women birthing in the United States. A secondary data analysis of the Infant Feeding Practice Study II and its Year 6 Follow-Up was conducted using IBM SPSS Statistics Version 24. Procedures for data analysis included frequencies, χ^2 tests, and ordinal logistic regressions. Outcomes revealed that feeding infants any formula during their hospital stay drastically reduces the likelihood for prolonged breastfeeding duration. Study results also concluded that offering a pacifier to infants during their hospital stay reduced the length of breastfeeding duration. This study confirms many of the primary breastfeeding practices that are at the frontline of maternity patient care in the United States. Establishing well-grounded practices that aid in the long-term duration of breastfeeding could help save lives and improve child and maternal health outcomes within the United States.

The Effect of Maternity Care Practices on the Duration of Breastfeeding

by

Lisette Rodriguez

BS, University of Miami, 2012

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

February 2019

Dedication

I am deeply indebted to all my family for their unconditional support and consistent encouragement. My mother, Aurora Rodriguez, thank you for taking great care of my children during all the necessitated quiet and alone time required to successfully undertake this research project. My father, Eduardo Rodriguez, a million thanks for providing me with useful resources and the inspiration that enabled me to the completion of this study. The last word of dedication is for my husband, Michael Garcia. I am profoundly thankful for all the love, support, and sacrifices you have made throughout these years. I dedicate this dissertation to my loved ones whom have shown me unparalleled support and who unconditionally love and believe in me.

Acknowledgments

After an intense journey of learning and personal growth, I would like to reflect on the people who have supported and helped me throughout this period. I am grateful to all of those whom I have had the pleasure to work with during this project. Each member of my dissertation committee has provided me with extensive and personal guidance. Dr. Loretta Cain aided my success by providing me with valuable feedback and revisions. Dr. Amy Thompson also strengthened my project by adding appreciated advice. I would especially like to thank Dr. Katie L. Callahan-Myrick, my mentor and chair, for sharing her insightful knowledge and for her invaluable contribution towards my dissertation. My deepest appreciation and gratitude also extend to Andres Pino. His profound knowledge in the statistical arena and voluntary willingness to tutor me helped me to overcome obstacles that ultimately facilitated my success.

Table of Contents

List of Tables

Chapter 1: Introduction to the Study

Introduction

The practice of breastfeeding is extensively recognized as the optimal feeding method for the mother-baby dyad (American Academy of Pediatrics, 2012; World Health Organization, 2016). Mother's breast milk provides essential energy and nutrients parallel to an infant's age up to one-third of the second year of life (World Health Organization, 2016). Breast milk also protects the infant against infectious and chronic diseases and stimulates sensory and cognitive development (World Health Organization, 2016). Exclusive breastfeeding and continuation of any breastfeeding for the recommended length of time reduce risks for common childhood illnesses such as diarrhea and pneumonia, two chief childhood killers (World Health Organization, 2016). The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for the first 6 months of life (WHO, 2016). After that, it is recommended for infants to receive complementary foods with continued breastfeeding for up to the first 2 years of life or beyond (WHO, 2016).

Although breastfeeding is a natural action performed by a mother/baby dyad, it is also a learned behavior that may require practice and assistance. Prevalent research has established that guidance from hospital caregivers helps to develop appropriate breastfeeding practices (O'Sullivan, Farver, & Smilowitz, 2015). In 1992, WHO and UNICEF launched the worldwide Baby-Friendly Hospital Initiative to help strengthen breastfeeding practices (WHO, 1998). The initiative is supported by the Ten Steps to Successful Breastfeeding, which summarizes fundamental maternity care practices

necessary to support breastfeeding in the clinical setting (WHO,1998). Uniform breastfeeding practices and information throughout the health system is required to aid mothers to initiate and sustain exclusive breastfeeding (WHO, 2014). Although some studies clarify the rationale for the Ten Steps, there remains a need for a comprehensive and critical review of the individual steps and their impact on breastfeeding success in the maternity setting (Perez-Escamilla, Martinez, & Segura-Perez, 2016).

Improving breastfeeding knowledge and practice among individuals caring for breastfeeding women is considered an essential aspect of this public health strategy (Centers for Disease Control and Prevention, 2013). Identifying primary breastfeeding practices and enhancing frontline maternity patient care in the United States could help create environments that place breastfeeding as the norm and encourage positive social change. Establishing breastfeeding as the preferred infant feeding method could help to save lives and improve child and maternal health outcomes (Office of the Surgeon General, 2011). Breastfeeding also upholds a high economic value and a significant return on investment (Bartick, 2011). As the continual practice of breastfeeding results in cost savings for parents, insurers, employers and society, the economic status of the United States is due to improve as more families breastfeed their young (Bartick, 2011).

This chapter will offer supporting evidence by summarizing research literature related to this topic as the gap in knowledge in this study is addressed in the background section. The research problem is stated and summarized in the problem statement identifying the problem as current, relevant and significant. The purpose of this study will then be followed by research questions and hypothesis. In this section, independent

and dependent variables will be identified, and pertinent associations being tested will also be recognized. A theoretical foundation is introduced to explain major notional propositions and relates theory to the study approach and research questions. The nature of the study provides detailed rationale for the selection of the study design and briefly summarizes the methodology used to collect and interpret data. While specific aspects of the research problem and potential boundaries of the study will be detailed under the scope and delimitations section, limitations of the study related to the design and methodology will be described within the limitations section. Finally, this chapter will close with the significance section that will recognize the potential contributions of the study and reflect the development of knowledge in this specific field.

Background

The Ten Steps to Successful Breastfeeding are the blueprint of the Baby-Friendly USA Initiative and are endorsed and promoted by leading maternal and child health authorities in the United States and globally (WHO, 2009). Baby-Friendly hospitals and birthing facilities must adhere to the Ten Steps to receive and retain a Baby-Friendly designation (Baby-Friendly USA, 2012). The Ten Steps consists of evidence-based health practices that have been shown to increase breastfeeding initiation and duration among health facilities and families (Office of the Surgeon General, 2011). Although the Ten Steps are widely practiced around the world, the steps are not yet grounded norms in the United States (Semenic, Childerhose, Lauziere, & Groleau, 2012).

A researcher studying breastfeeding practices among pediatric nurses concluded that most nurses working directly with mother/baby dyads could not adequately support

breastfeeding concerns due to insufficient knowledge and unfavorable attitudes about breastfeeding (Brewer**,** 2012). Many nurses used personal breastfeeding experiences instead of evidence-based practices to guide their patients (Brewer**,** 2012). An author indicated that 44.7% of participating nurses in this study noted nursing school as their primary source of breastfeeding knowledge (Brewer**,** 2012). While developing their levels of breastfeeding knowledge and skills, healthcare providers should be educated on topic areas. A strong focus on approaches to increase breastfeeding rates and methods to improve maternal satisfaction can help to advance overall breastfeeding results within their facilities (Barnes, Cox, Doyle, & Reed, 2010). Educating hospital staff has been found to facilitate the implementation of breastfeeding practices within birthing facilities (Barnes et al., 2010). The surgeon general's call for action declares that "there are few opportunities for future physicians and nurses to obtain education and training on breastfeeding, and the information on breastfeeding in medical texts is often incomplete, inconsistent, and inaccurate" (U.S. Department of Health and Human Services, 2011, p. 9). This demonstrates that a strong emphasis should be placed on the improvement of breastfeeding education in nursing and medical school.

Based upon an evaluation of a practice-development initiative, authors indicated that the combination of policy change, ongoing support and the introduction of a breastfeeding educational program increased breastfeeding rates over time (Barnes et al., 2010). Despite reasonable breastfeeding knowledge among staff, after the implementation of the program, a significant difference occurred regarding breastfeeding practices (Barnes et al., 2010). Results showed that as staff adhered more to the

breastfeeding practices recommended in the Ten Steps, information provided to breastfeeding women and their hospital experience increased (Barnes et al., 2010). Overall, researchers concluded that structured breastfeeding programs have a positive influence on the initiation and duration of breastfeeding (Beake, Pellowe, Dykes, Schmied, & Bick, 2012). Researchers also determined that breastfeeding interventions have a positive effect on increasing short-term and long-term breastfeeding rates in the hospital setting (Chung, Raman, Trikalinos, Lau, & Ip, 2008).

Other studies aiming to determine the degree of noncompliance with each of the Ten Steps concluded that combinations of steps were associated with shorter breastfeeding durations (Nickel, Labbok, Hudgens, & Daniels, 2013). The lack of Step 6 of the Ten Steps was related to shorter breastfeeding duration, while the lack of Steps 4 and 9 together was associated with the most significant decrease in breastfeeding duration (Nickel et al., 2013). Study findings established a dose-relationship among the steps and concluded that specific combinations of steps might be associated with increased duration of breastfeeding (Nickel et al., 2013). Therefore, if relationships can be established among the Ten Steps and this gap in knowledge can be scrutinized to determine the most successful set of steps, then all hospitals and birthing centers in the United States, not only Baby-Friendly designated, can benefit from this knowledge and potentially improve their breastfeeding rates and practices.

Problem Statement

The natural practice of breastfeeding has been strongly noted as one of the most cost-effective, health promoting, and disease-prevention strategies of the 21st century

(Varaei, Mehrdad, & Bahrani, 2009). Although primary health organizations recommend exclusive breastfeeding for the first 6 months of life with added complementary foods and continued breastfeeding up to 2 years of age or longer, many mothers do not breastfeed their infants for the recommendation length of time (American Academy of Pediatrics, 2012). Exclusive breastfeeding offers infants long-term protection against chronic conditions such as obesity, diabetes, asthma, sudden infant death syndrome (SIDS), respiratory and gastrointestinal diseases, and childhood cancers (Office of the Surgeon General, 2011). In addition, exclusive breastfeeding is associated with better health outcomes for mothers with lowered risks of ovarian and breast cancers (Office of the Surgeon General, 2011). Grounded evidence indicates that support from a skilled health professional can have a positive effect on initiation, duration, and experiences of breastfeeding (Battersby, 2014). In addition, continuous Centers for Disease Control and Prevention data from Maternity Practices in Infant Nutrition and Care established that breastfeeding-related maternity practices during labor and delivery, postpartum care, and discharge planning could encompass widespread barriers against the natural practice of breastfeeding (Centers for Disease Control and Prevention, 2015a). As most mothers deliver their babies in a hospital setting (Hamilton, Martin, & Ventura, 2009), it is vital that maternity healthcare providers encompass evidence-based knowledge and practices on breastfeeding and are trained how to assist mothers in all aspects of breastfeeding adequately.

The Baby-Friendly Hospital Initiative (BFHI) is a global program sponsored by the World Health Organization (WHO) and the United Nations Children's Fund

(UNICEF) to encourage and recognize hospitals and birthing centers that offer an optimal level of care for lactation based on the WHO/UNICEF Ten Steps to Successful Breastfeeding for Hospitals (Baby-Friendly USA, 2016). Applied policies and health practices, such as those described under the Ten Steps to Successful Breastfeeding, have been noted as contributing factors that can considerably impact the way women choose to feed their infants (Walsh, Pincombe, & Henderson, 2011). Although a review of the literature establishes that Baby-Friendly hospital facilities increase breastfeeding rates (Perez-Escamilla et al., 2016), only 375 United States hospitals hold Baby-Friendly designation (Baby-Friendly USA, 2016). Therefore, only 18.57% of annual U.S. births occur at Baby-Friendly designated facilities (Baby-Friendly USA, 2016). Many challenges and barriers associated with the establishment of a Baby-Friendly designation such as cost, resistance, lack of organizational support, and monitoring (DelliFraine, Langabeer, Delgado, Williams, & Gong, 2013) are preventing most U.S. hospitals from becoming Baby-Friendly. Since hospital breastfeeding practices vary worldwide (Heymann, Raub, & Earle, 2013), it is essential to identify the primary factors that are affecting breastfeeding duration within the United States. Identifying primary breastfeeding practices that support breastfeeding duration will offer substantial evidence to help strengthen maternity care practices within the United States. Filling this gap in the literature will increase the likelihood of all mothers delivering within U.S. health facilities of meeting their breastfeeding goals and improving the overall health and economic status of the United States.

Purpose of the Study

The purpose of this cross-sectional study is to identify breastfeeding-related maternity care practices that increase breastfeeding duration within the United States. Measuring breastfeeding practices along with consequential breastfeeding duration experienced by families within U.S. birthing facilities will determine the primary breastfeeding indicators that are helping to strengthen breastfeeding duration among breastfeeding mothers in the United States. Indicators corresponding to the Ten Steps to Successful Breastfeeding include prenatal breastfeeding education (Step 3), early initiation of breastfeeding (Step 4), teaching breastfeeding techniques (Step 5), limited supplementation of breastfeeding infants (Step 6), rooming-in (Step 7), teaching feeding cues (Step 8), limited use of pacifiers (Step 9), and post discharge support (Step 10) (Baby-Friendly USA, 2016). In accordance to The International Code of Marketing of Breast Milk Substitutes, which aims to limit any marketing of breast milk substitutes to patients, variables such as the distribution of a gift pack containing formula will also be set as study indicators. These indicators will be set as independent variables and will be sited parallel to the extent of breastfeeding duration. Statistical regression will measure strengths in relationships among independent and dependent variables.

Research Questions and Hypothesis

RQ1. Is there an association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders?

$H_0$1: There is no association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders.

H_A1: There is an association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders.

RQ2. Is there an association between the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders?

$H_0 2$: There is no association between any of the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders.

$H_A 2$: There is an association between any of the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders.

Theoretical Framework

Breastfeeding is a natural behavior that is directly influenced by a multitude of internal and external motivational factors (American Academy of Pediatrics, 2012). Breastfeeding research should consider psychosocial constructs that can help to explain these motivational influences and simultaneously fill the knowledge void between the intentions and behaviors of medical personnel (Perez-Escamilla, 2012; Perez-Escamilla & Chapman, 2012; Schwarzer, 2008; Venancio, Saldiva, Escuder, & Giugliani, 2012). The theory of planned behavior aided me in explaining and predicting the intentions of healthcare professionals as they adopt innovative clinical practices (see Godin, Bélanger-

Gravel, Eccles, & Grimshaw, 2008; Eccles, Hrisos, Francis, Kaner, Dickinson, Beyer, & Johnston, 2006). In addition, moral norms and past adaptations of practice were extracted from the theory of interpersonal behavior and added as an extension to the theory of planned behavior (see Triandis, 1980). The theory of planned behavior fits well into this study as it understands that individual self-control and the decisions individuals make may alter under situations where they are not fully capable of making voluntary decisions, such as hospital employees.

The theory of planned behavior is constructed of four classified groups: intention, attitude, subjective norm, and perceived behavioral control (Ajzen, 1991). It has been noted that intention and perceived behavioral control are useful predictors of healthcare professional practices (Ajzen, 1991). Within this prediction, an individual's intention has been distinguished as a result of their motivation to perform a specific practice (Ajzen, 1991). On that same note, perceived behavioral control refers to the level of difficulty that an individual must surpass in order to adopt a specific clinical practice (Ajzen, 1991). Consequently, an individual's intention can be predicted by attitude, subjective norm and perceived behavioral control.

The theory of planned behavior has been used to study the intentions of breastfeeding women and the purposes of recommending breastfeeding by nurses and dieticians to mothers during an infant's first six months of life (Daneault, Beaudry, & Godin, 2004). To gain a deeper understanding of nurses' behaviors in clinical practice, additional psychosocial variables such as Triandis's moral norm may offer significant explanations of the intentions of health professionals (Perkins, Jensen, Jaccard,

Gollwitzer, Oettingen, Pappadopulos, & Hoagwood, 2007). Moral norm uses ethical considerations of healthcare professionals to provide grounds of moral obligations felt by these individuals to adopt clinical health practices (Godin et al., 2008). Past behavior can also be used to measure the perceived effect of past experiences and their impact on a current situation (Rashidian, Miles, Russell, & Russell, 2006). Therefore, moral norms and previous adaptations of practice will be extracted from the theory of interpersonal behavior and added as an extension to the theory of planned behavior (Triandis, 1980).

Nature of the Study

This cross-sectional, secondary data analysis examined breastfeeding care practices determined under the neonatal state of the CDC Infant Feeding Practices Study II and participant breastfeeding durations under its Year 6 Follow-Up to identify the primary maternity care breastfeeding practices that aid in the increase of breastfeeding durations within the United States. In addition, by using this research approach I was able to identify practices corresponding to the Ten Steps to Successful Breastfeeding and the International Code of Marketing of Breast Milk Substitutes that most significantly impact breastfeeding duration in the United States. Results determined the existence of relationships among the breastfeeding care indicators that can be associated with the increased duration of breastfeeding within the United States.

The CDC and the Food and Drug Administration (FDA), in partnership with other federal agencies, conducted the IFPS II from 2005-2007 and its Y6FU to better comprehend and improve the health status of children and mothers in the United States (Fein, Labiner-Wolfe, Shealy, Li, Chen, & Grummer-Strawn, 2008). The focused

breastfeeding care practices were extracted from the neonatal questionnaire. This questionnaire examined factors that affect infant feeding decisions, generally occurring at the time of birth and during the neonatal state (Chen et al., 2008). At this period infants were approximately three weeks old.

Breastfeeding care practice indicators extracted from this questionnaire included the following: (a) attendance of prenatal breastfeeding classes, (b) pacifier usage during hospital stay, (c) hospital gift packs including infant formula (d) length of time after delivery when breastfeeding was first initiated, (e) birthing facility staff assisted with breastfeeding, (f) length of time after delivery when mother first received help with breastfeeding, (g) rooming-in, (h) baby fed formula while in the hospital, and (i) discharged with breastfeeding support resources. These breastfeeding practice indicators were set parallel to the number of weeks any breastfeeding was offered by each mother. In 2012, when children from IFPS II were 6 years of age, mothers were recontacted to participate in a cross-sectional mail survey for a follow-up (Chen et al., 2008). This information is extracted from the Y6FU.

Definition of Terms

The following terms and phrases are defined and used in this study:

Any breastfeeding: The feeding of an infant or young child of any mother's breast milk, including expressed breast milk with allowable supplemental infant feeding (AAP, 2012).

Baby-Friendly Hospital Initiative: A global initiative launched in 1991 by the World Health Organization and UNICEF in the effort to implement health practices that protect, promote and support breastfeeding (Baby-Friendly USA, 2012).

Baby-Friendly Hospital Initiative education program: A 20-hour course for maternity staff used by maternity facilities to strengthen the knowledge and skills of their staff towards successful implementation of the Ten Steps to Successful Breastfeeding and the International Code of Marketing (UNICEF & World Health Organization, 2009).

Breastfeeding: The method of feeding nutrient-rich breast milk to an infant directly from or expressed from a mother's human breasts (World Health Organization, 2014).

Breastfeeding duration: The length of time by which an infant is fed breast milk regardless of whether she has ceased lactating or has introduced breast milk substitutes or complementary foods (Geraghty & Rasmussen, 2010).

Breastfeeding initiation: Delivery of a mother's breast milk to her infant for the first time (World Health Organization, 2014).

Breastfeeding practices: Maternity care practices relating to breastfeeding that take place during the intrapartum hospital stay, such as practices related to immediate prenatal care, care during labor and birthing, and postpartum care (Centers for Disease Control and Prevention, 2015b).

Complementary foods: Any nonbreastmilk foods or nutritive liquids that are given to young children after 6 months of age that are readily consumed and digested by the

young child and that provide additional nutrition to meet all the growing child's needs (Brown et al., 1998).

Ever breastfed: Infants who have been put to the breast, if only once, and includes infants who have received expressed breast milk but have never been put to the breast during a specified time period *(*World Health Organization, 2002).

Exclusive breastfeeding: A mother who only gives her breast milk, either directly from the breast or expressed, to her infant with no other food or liquids other than allowable oral rehydration solutions, drops, and syrups such as vitamins, minerals, and medicines (World Health Organization, 2002).

Initial feeding: Method and nutrient by which an infant receives their first feeding after birth (World Health Organization, 2003).

Maternity setting: Facilities specializing in caring for women while they are pregnant and during childbirth (Simkin, Bolding, Keppler, Durham, & Whalley, 2010). Maternity facilities also provide care for newborn infants and may act as centers for clinical training in midwifery and obstetrics (Simkin et al., 2010). Settings may include hospitals and birthing centers (Simkin et al., 2010).

Supplemental feeding: A feeding provided to an infant in addition to, or as a substitute for breastfeeding, such as infant formula, water, fruit juice, and water-based drinks (World Health Organization, 2003).

Ten Steps to Successful Breastfeeding: A set of 10 evidence-based steps that outline best practices in hospital settings with the goal of helping mothers initiate and continue breastfeeding (World Health Organization, 2014).

Assumptions

The IFPS II is a longitudinal survey of mothers beginning in the third trimester of pregnancy and collecting data approximately monthly throughout their infant's first year (Fein et al., 2008). A nationally distributed consumer opinion panel of 500,000 households initiated the IFPS II survey (Fein et al., 2008). All questionnaires were administered by mail and were sent to each participant on 10 separate time periods (Fein et al., 2008). Eligibility criteria included that the mother be at least 18 years old and the infant be a singleton born at ≥35 weeks gestation, weighing at least 5 pounds, and without medical conditions that would affect feeding. It was assumed that self-reported data may be subject to suspect and may be inaccurately affected by social desirability and recall bias (King & Bruner, 2000).

In addition, the following assumptions have been applied to this study:

- The study participants accurately reported the data and responded to the best of their ability.
- Cultural competence was appropriate in the survey instrument.
- Healthcare providers working in maternity can impact a women's infant feeding decision.
- The studied healthcare practices help to increase breastfeeding rates in a maternity setting.

Scope and Delimitations

The scope of the study involved the analysis of data obtained from the 1,542 participants who completed the Y6FU. Control variables entered into the regression from

the prenatal questionnaire included demographic characteristics such as marital status, education, race/ethnicity, and household income. A delimitation is the lack of specification of breast milk to formula ratio when referring to feeding indicators other than exclusive breastfeeding. Obtaining breastfeeding outcomes from self-reports can also lead to uncontrolled recall bias.

Limitations

There were several limitations to this study.

- Data from the IFPS II were obtained by maternal recall when children were about 3 weeks of age and from the Y6FU at 6 years of age. Self-reporting may not be the ideal mechanism to collect data. It may be one of the few pragmatic tools used to collect breastfeeding outcomes. This data collection method could potentially produce uncontrolled recall bias.
- Due to the varied social desirability of particular health behaviors, such as breastfeeding, there is a risk of nondisclosure or over disclosure. This phenomenon may lead to underestimations or overestimations in the data. To increase the generalizability of the results, a randomized selection of study participants was preferred over self-selection.
- Populations categorized by distinct demographics, educational levels, income and social and cultural norms, may differ by geographic location. Therefore, state breastfeeding results may not be generalizable to specific populations in different states. In this case, a randomized selection of participants is also preferred over self-selection.

Significance of the Study

Establishing a Baby-Friendly designation is a needed and progressive advancement for any birthing facility (Baby-Friendly USA, 2012). To realize this accomplishment, each facility must complete the Baby-Friendly USA 4-D Pathway to Baby-Friendly Designation, implement the International Code of Marketing of Breast Milk Substitutes and adhere to the Ten Steps to Successful Breastfeeding (Baby-Friendly USA, 2012). The impact of implementing evidence-based maternity care practices has been studied and found to improve breastfeeding rates as well as its duration (Munn, Newman, Mueller, Phillips, & Taylor, 2016). Despite this knowledge, most birthing facilities run into obstacles that might prolong or cease their path towards designation (Munn et al., 2016). Setting evidence-based maternity care practices parallel to breastfeeding durations in the attempt to find the most impactful breastfeeding health practices could contribute to the advancement of knowledge in the discipline. Ultimately, it could also aid all birthing facilities towards the improvement of their breastfeeding rates. Birthing facilities, health educators, and breastfeeding advocates could encompass the knowledge necessary to prioritize the most effective breastfeeding practices in the United States. This health-promotion strategy can help to increase breastfeeding rates nationwide while surpassing impediments linked to the establishment of a Baby-Friendly designation. It is imperative to fill this gap of research and determine those primary hospital breastfeeding practices that are positively influencing breastfeeding durations in the United States.

Summary

Although widespread research has proven extensive benefits of breastfeeding for the mother/baby dyad, many mothers giving birth in the United States choose not to breastfeed their young (Centers for Disease Control and Prevention, 2016). Identifying factors that contribute to this phenomenon, such as recognized maternity health care practices, are an important intervention that could help to increase breastfeeding rates within the United States. The purpose of this study is to assess which health practices most significantly impact breastfeeding rates duration in the United States. Study results may determine the presence of dose-relationships among breastfeeding health practices and could give priority to those breastfeeding practices that are most impactful.

This chapter addressed this gap in knowledge and summarizes the literature related to this topic. The research problem is addressed with current, relevant and significant information that explain the tested associations. A detailed rationale for the selection of the study design is described, and potential contributions of the study reflect the development of knowledge in this specific field. While Chapter 1 highlighted the importance of this study and provided a summary of the executed focus, Chapter 2 offers a theoretical foundation along with a detailed review of the literature associated with beneficial breastfeeding care practices.

Chapter 2: Literature Review

Introduction

Although leading health organizations such as the American Academy of Pediatrics, CDC, WHO, and the Surgeon General have recommended breastfeeding as the prime choice for infant feeding, many mothers do not breastfeed their young for the recommended length of time (American Academy of Pediatrics, 2012). It has been noted that health professionals in the maternity setting profoundly influence the likelihood of a mother breastfeeding her infant (Battersby, 2014). The proper performance of breastfeeding-related maternity care practices during labor and delivery, postpartum care, and discharge planning can help mother/baby dyads achieve their breastfeeding goals and consequently increase breastfeeding rates in the maternity setting (CDC, 2015).

The BFHI is a global program sponsored by the WHO and UNICEF to encourage and recognize hospitals and birthing centers that offer an optimal level of care for lactation based on the WHO/UNICEF Ten Steps to Successful Breastfeeding for hospitals (Baby-Friendly USA, 2016). Specific policies and health practices, such as those described under the Ten Steps to Successful Breastfeeding and other state indicators of measurement, have been noted as primary contributing elements that significantly impact the means by which women choose to feed their infants (Walsh et al., 2011). Due to the many challenges and barriers associated with the establishment of Baby-Friendly designation, only 375 birthing facilities within the United States hold this title (Baby-Friendly USA, 2016). Subsequently, only 18.57% of all annual U.S. births occur within Baby-Friendly facilities (Baby-Friendly USA, 2016). Therefore, it is

important to identify primary breastfeeding-related indicators that aid in the increase of breastfeeding rates among U.S. birthing facilities. This gap in the literature will offer all U.S. birthing facilities, not only those deemed Baby-Friendly, the necessary knowledge to implement those particular health practices in the effort to increase breastfeeding rates and the overall health and economic status of the United States.

This chapter is a presentation of current literature pertaining to the problem as well as literature and search strategies used to gather pertinent information. I also explain the theoretical foundation I used to help illustrate major propositions and hypothesis relating to the studied discipline. In addition, a comprehensive literature review of studies related to the discipline, along with methodologies, methods, and approaches, will be described in this chapter.

Literature Search Strategy

Research related to the Baby-Friendly Initiative began in 1991 when the initiative was initially executed. Walden University's Online Library system for EBSCO Host Academic Search Complete, MEDLINE with full text and Google Scholar, were used to search for pertinent literature. Searches were exclusive to current peer-reviewed articles. Key search words included *Baby-Friendly, Ten Steps to Successful Breastfeeding, breastfeeding* and *maternity breastfeeding practices*. Combinations of key search words included *breastfeeding + practices; theory of planned behavior + breastfeeding + maternity + nursing; theory of interpersonal behavior + breastfeeding + moral norms + past adaptation;* and *ten steps to successful breastfeeding + barriers; breastfeeding + economy + environment*.

Theoretical Foundation

The natural practice of breastfeeding is subjectively influenced by a number of internal and external motivational factors. Thus, breastfeeding research should account for the psychosocial constructs that build on these motivational factors to help explain the gap between the intentions and behaviors of medical professionals and breastfeeding families (Perez-Escamilla, 2012; Perez-Escamilla & Chapman, 2012; Schwarzer, 2008; Venancio et al., 2012). The theory of planned behavior states that behavior is determined by intention and perceived behavioral control (Ajzen, 1991). For the purpose of this study, moral norms and past adaptations of practice were extracted from the theory of interpersonal behavior and added as an extension to the theory of planned behavior (Triandis, 1980). By offering explanatory understanding to individual self-control and decision-making situations, such as those taken by hospital employees, these theories can help to explain these modifiable determinants of breastfeeding intentions and behaviors taken by healthcare professionals and the families they counsel (see Cabieses, Waiblinger, Santorelli, & McEachan, 2014).

The theory of planned behavior is constructed of four classified groups: intention, attitude, subjective norm and perceived behavioral control (Ajzen, 1991). Intention is predicted by attitudes and is defined by the extent to which a behavior is evaluated positively or negatively (Ajzen, 1991). Intentions can also be distinguished as the result of an individual's motivation to perform a specific practice (Ajzen, 1991). Perceived behavioral control is the extent to which an individual feels able to perform a behavior (Ajzen, 1991). It refers to the level of difficulty that an individual must surpass in order

to adopt a specific clinical practice and/or the extent to which an individual feels able to perform a behavior (Ajzen, 1991). Subjective norms are referred to as the extent to which others would approve of a behavior (Ajzen, 1991). Consequently, intention and perceived behavioral control have been noted as useful predictors of healthcare professional practices (Ajzen, 1991). The theory of planned behavior offers respectable explanatory power, classically clarifying around 19% variance is prospective behavior, and 44% variance of intention for general health behavior (McEachan, Conner, & Taylor, 2011). The theory takes into consideration behavior that is not entirely under voluntary control of individuals, such as those who are constricted to the rules and practices of their facility (Eccles et al., 2006). The theory of planned behavior is well known for its explanatory ability to predict the intention of healthcare professionals during the adoption of clinical practices, especially among nurses (Eccles et al., 2006; Godin et al., 2008). In addition, the founding concepts of the theory of planned behavior have explained 56% of the variance in mothers' intention to breastfeed (McMillan, Conner, Woolridge, Dyson, Green, Renfrew, Bharj, & Clarke, 2008).

In this study, intention is referred to as the level of motivation presented by healthcare professionals when performing new clinical breastfeeding practices. In this case, an individual's intention can be predicted by attitude, subjective norm, and perceived behavioral control (Ajzen, 1991). Attitude denoted levels of satisfactory or unsatisfactory evaluation of the adoption of new breastfeeding knowledge and counseling skill sets by healthcare professionals in the maternity setting. Subjective norm referred to the perception of approval of the healthcare staff by the mother's surrounding networks

such as colleagues, family, and friends. Attitude, subjective norm, and perceived behavioral control were respectively defined by behavioral, normative, and control beliefs. In this scenario, behavioral beliefs refer to the individual's perceived advantage and disadvantage of adopting new clinical breastfeeding practices. Normative beliefs reflected the individuals' perceived mark of approval of these clinical breastfeeding practices. Finally, controlled beliefs denoted any barriers and facilitators towards the adoption of new clinical breastfeeding practices.

The theory of planned behavior has been used to study the intentions of breastfeeding women and the intentions of recommending breastfeeding by nurses and dieticians to mothers during an infant's first six months of life (Daneault et al., 2004). To gain a deeper understanding of nurse's behaviors in clinical practice, additional psychosocial, variables such as Triandis's moral norm may offer significant explanations of the intentions of health professionals (Perkins et al., 2007). Moral norm uses ethical considerations of healthcare professionals to provide grounds of moral obligations felt by these individuals to adopt new clinical health practices (Godin et al., 2008). Past behavior can also be used to measure the perceived effect of past experiences and their impact on a current situation (Rashidian et al., 2006). Moral norms have been documented as having a direct impact on behavior and have aided in closing the gap between the intention and behavior (Hamilton, Daniels, White, Murray, & Walsh, 2011; Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012). Researchers of a study evaluating the adoption of the Baby-Friendly Hospital Initiative by perinatal nurses concluded that perceived behavioral control, subjective norm, and moral norm explained

a significant proportion of their intentions to adopt new practices (Chabot & Lacombe, 2014). Therefore, moral norms and past adaptations of practice will be extracted from the theory of interpersonal behavior and added as an extension to the theory of planned behavior (Triandis, 1980).

Literature Review

Exclusive breastfeeding is recommended for the first 6 months of an infant's life (AAP, 2012; WHO, 2016). Maternal breast milk provides infants all necessary nutrients, energy, immunity, and hydration and stimulates sensory and cognitive development (AAP, 2012; WHO, 2016). The act of breastfeeding is also beneficial for maternal health as it helps to prevent ovarian and breast cancer, Type 2 diabetes, rheumatoid arthritis, cardiovascular disease, high blood pressure, and high cholesterol (Dieterich, Felice, O'Sullivan, & Rasmussen, 2013). Breastfeeding is also financially sustainable for the national health system, the economy (Bartick, 2011) and the environment (Office of the Surgeon General, 2011). Although the natural practice of breastfeeding is widely recognized as the optimal feeding method for the mother/baby dyad (AAP, 2012; WHO, 2016), many families birthing in the United States choose not to breastfeed their young.

Ten Steps to Successful Breastfeeding

In 1991, the WHO launched the Baby-Friendly Hospital Initiative in the attempt to promote exclusive breastfeeding in the maternity settings and strengthen breastfeeding practices worldwide (Baby-Friendly USA, 2012). Baby-Friendly facilities must adhere to the Ten Steps to Successful Breastfeeding and comply with the International Code of Marketing of Breast Milk Substitutes (Baby-Friendly USA, 2016). The CODE is a

global public health strategy endorsing boundaries around the marketing and usage of breast milk substitutes within maternity settings (WHO, 1981). The Ten Steps to Successful Breastfeeding are as follows (Baby-Friendly USA, 2016):

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff.
2. Train all healthcare staff in the skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6. Give infants no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in – allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no pacifiers or artificial nipples to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or birth center.

Although evidence shows higher breastfeeding success rates among facilities that incorporate the Ten Steps to Successful Breastfeeding, barriers impede many facilities from completing the Baby-Friendly designation process (Semenic et al., 2012; Smith,

Moore, & Peters, 2012). A multiplicity of obstacles such as obtaining administrative and governmental endorsements from local policymakers and administration, effective transformational leadership leading the designation process, operative breastfeeding training for healthcare professionals, influential marketing of formula companies and hospital and community health services (Semenic et al., 2012; Johnson, Lamson, Schwartz, Goldhammer, & Ellings, 2015). Specific steps create more significant barriers than others-specifically, the exclusion of supplementation, pacifier usage, rooming-in 24 hours and skin-to-skin immediately after birth (Smith et al., 2012).

Researchers concluded that using context-focused research implementation models could help to identify effective strategies and aid in the adoption of evidence-based breastfeeding health practices (Semenic et al., 2012). Recommendations to enhance practice improvements are most relevant among the steps that require the fewest resources and administrative changes (Johnson et al., 2015). Researchers concluded that combinations of specific steps are associated with shorter breastfeeding durations (Nickel et al., 2013). Specifically, the lack of step 6 is related to shorter breastfeeding duration, while the lack of Steps 4 and 9 together are associated with the most significant decrease in breastfeeding duration (Nickel et al., 2013). In addition, marketing potential changes by resonating with decision makers and advocating to build capacity for internal and external system changes have been found to be effective execution strategies (Johnson et al., 2015). Although there are a number of studies that clarify the rationale for the 'Ten Steps', there remains a need for a comprehensive and critical review of individual steps

and their impact on breastfeeding success in the maternity setting (Perez-Escamilla et al., 2016).

For the purpose of this study, breastfeeding healthcare practice indicators were set parallel to breastfeeding duration time periods. Practice indicators included: (a) attendance of prenatal breastfeeding classes, (b) pacifier usage during hospital stay, (c) hospital gift packs including infant formula, (d) length of time after delivery when breastfeeding was first initiated, (e) birthing facility staff assisted with breastfeeding, (f) length of time after delivery when mother first received help with breastfeeding, (g) rooming-in, (h) baby fed formula while in the hospital, and (i) discharged with breastfeeding support resources. These breastfeeding practice indicators were set parallel to the duration of week's any breastfeeding was offered by each mother.

Summary

It is important to identify primary factors associated with breastfeeding duration within the United States. The purpose of this cross-sectional study is to identify breastfeeding-related maternity care practices that increase breastfeeding duration within the United States. Measuring and identifying primary breastfeeding practices that are improving breastfeeding durations within the United States will help to increase hospital breastfeeding rates among all U.S. hospitals and prolong breastfeeding durations. Filling this gap in the literature will help to increase the likelihood of all mothers delivering within U.S. health facilities of meeting their breastfeeding goals and increase the overall health and economic status of the United States.

Chapter 3 highlights the research design, study variables, its rationale, and makes clear connections to the research questions. It defends the choice of design by providing evidence parallel to current research designs needed to advance knowledge in the discipline. Study methodology is defined in detail to allow for the replication. In addition, items such as population, sampling, sampling procedure and data collection further progress the development of the study. Threats to external and internal validity are also identified and addressed. Disclosure of any ethical procedures and concerns can also be found in Chapter 3.

Chapter 3: Research Method

Introduction

The purpose of this cross-sectional study is to identify breastfeeding-related maternity care practices that increase breastfeeding duration within the United States. This research approach was used to indicate most practices corresponding to the Ten Steps to Successful Breastfeeding and those used among Baby-Friendly facilities that most significantly impact breastfeeding duration. Although Baby-Friendly facilities help to improve breastfeeding practices (Beake et al., 2012), it is not the solitary pathway to advance breastfeeding outcomes. In this study, I identified primary breastfeeding practices that are helping to increase breastfeeding durations within the United States. Filling this gap in the literature will help to increase the likelihood of all mothers delivering within U.S. health facilities of meeting their breastfeeding goals and enhancing the overall health and economic status of the United States.

This chapter contains information about the research design, studied variables, research questions and hypothesis, data collection and analysis, and ethical considerations. Threats to external and internal validity are also identified and addressed. My choice of design is explained by establishing evidence parallel to current research designs required to advance knowledge in the discipline. Study methodology is defined in detail to allow for the replication.

Research Design and Rationale

Initial outcomes from the IFPS II were used as the basis to its Y6FU. Statistical regression formulated significant relationships among the breastfeeding practices that

influence breastfeeding durations. Results also determined the extent by which measured indicators are associated with increased breastfeeding duration within the United States.

Description of Research Variables

A cross-sectional design was chosen to help establish if the independent variables have influence on the dependent variable.

The dependent variable and measured outcome were:

Breastfeeding duration: Number of week's mothers reported breastfeeding or pumping milk for their infants.

The independent variables correspond independently and directly to the Ten Steps to Successful Breastfeeding and the International Code of Marketing of Breast Milk Substitutes.

Independent variables include:

Attendance of prenatal breastfeeding classes: Classes may consist of an exclusive breastfeeding class or a prenatal class that included breastfeeding.

Pacifier usage: If, during the hospital stay, the baby was given a pacifier by the mother, medical staff, or anyone else.

Hospital gift packs including infant formula: Mother received a gift pack or diaper bag from the hospital, birth center, or childbirth class that included infant formula.

Length of time after delivery when breastfeeding was first initiated after delivery: Breastfeeding initiated after birth in less than 60 minutes, 1-6 hours, or more than 7 hours after delivery.

Birthing facility staff assisted with breastfeeding: Hospital staff did/did not assist the mother with breastfeeding by showing her or talking to her about breastfeeding.

Length of time after delivery when mother first received help with breastfeeding: If mother received help with breastfeeding, she first received help within less than 60 minutes, 1-6 hours, 7-24 hours, or more than 1 day after delivery.

Rooming-in: While admitted to the hospital or birth center, baby did/did not stay in the room day and night with mother, except for doctor visit, bathing, or other treatments. Answers include: yes, all the time; yes, some nights but not all; or no.

Baby fed formula while in the hospital: While admitted to the hospital or birth center, the baby was/was not/don't know fed formula.

Discharged with breastfeeding support resources: Mother was/was not given information about breastfeeding support groups or services before she was discharged from the hospital or birth center.

Mother enrolled in WIC: Mother was/was not enrolled in WIC when her baby was born.

The control variables include:

Yearly household income: Household income categories are labeled as less than $19,999, $20,000-$49,999, $50,000-$99,999 and $100,000 or more.

Marital status: Mother is married or not married.

Maternal race and ethnicity: White or other.

Maternal age: Age of mothers are categorized 18-24, 25-34, or 35-45 years of age.

Maternal education: Mother's highest level of education: high school graduate, 1-3 years of college, college graduate, or postgraduate education.

A description of the dependent variable, independent variables and control variables are detailed in Table 1.

Table 1

Description of Variables

Dependent Variable	Categorical or Continuous	Range or categories
Breastfeeding duration	Categorical	Under 0 weeks; 1-24 weeks; 25-52 weeks; 53 weeks or more
Independent Variables		
Attendance of prenatal breastfeeding classes	Categorical	Yes; No
Pacifier usage within birthing facility	Categorical	Yes; No; Don't know/not sure
Received formula inside hospital gift pack	Categorical	Yes; No
Breastfeeding first initiated after delivery	Categorical	0-60 minutes; 1-6 hours; 7 or more hours
Birthing facility staff assisted with breastfeeding	Categorical	Yes; No
Time after delivery mother first received help with breastfeeding	Categorical	0-60 minutes; 1-6 hours; 7-24 hours; 1 day or more

Independent Variables	Categorical or Continuous	Range or categories
Rooming-in	Categorical	Yes, all the time; Yes, some nights but not all; No
Baby fed formula	Categorical	Yes; No; Don't know/not sure
Discharged with breastfeeding resources	Categorical	Yes; No
Mother enrolled in WIC	Categorical	Yes; No
Control Variables		
Yearly household income	Categorical	Less than $19,999; $20,000-$49,999; $50,000-$99,999; $100,000 or more
Marital status	Categorical	Married; Not married
Maternal race and ethnicity	Categorical	White; Other
Maternal age	Continuous	18-24 years; 25-34 years; 35-45 years
Maternal education	Categorical	Up to high school graduate; 1-3 years college; College graduate; Post-graduate

Methodology

A cross-sectional methodology was used to assess associations between particular maternity health practices and breastfeeding duration among women birthing in the United States. A secondary data analysis of the IFPS II and its Y6FU was conducted using IBM SPSS Statistics Version 24.

Population

The IFPS II used a nationally distributed consumer opinion panel of 500,000 households with a final sample of 4,902 participants (Fein, Li, Chen, Scanlon, & Grummer-Strawn, 2014). Its Y6FU sampling frame included all qualified participants who answered at least the first postnatal questionnaire (Fein et al., 2014). They attempted to contact 2,958 mothers and obtained 1,542 completed questionnaires, a response rate of 52.1% (Fein et al., 2014).

Sampling and Sampling Procedures

Ongoing participants of the IFPS II were mailed a prenatal questionnaire as well as ten postnatal questionnaires in the attempt to collect data at specific infant age frames. The overall goal of qualifying criteria was to achieve sample objectives of healthy term or near-term singleton infants. First attempt to survey was administered by mail in 2012, and non-respondents were contacted for a telephone interview.

Two sample evaluations were conducted. The first sample evaluation compared respondents and non-respondents on data from the IFPS II. The second compared its Y6FU with 6-year-old participants in the National Survey of Children's Health. Researchers concluded that Y6FU mothers were more likely to be white, married, older,

and of higher education and income when compared to nonrespondents and nationally representative mothers (Fein et al., 2014). Researchers also discovered many health-related differences and similarities. Although neither the IFPS II nor the Y6FU sample is nationally representative, the Y6FU provides a valuable database due to its extensive coverage of health issues unique to early feeding patterns and outcomes at six years of age (Fein et al., 2014).

Longitudinal data were collected with a prenatal questionnaire; a telephone interview near the time of birth of the child; a neonatal questionnaire sent when the child was about a month old; and 9 questionnaires about infant feeding, health care and other related issues sent approximately every 7 weeks until the child was 12 months (Fein et al., 2008). Participants must have completed the prenatal questionnaire in order to be eligible as a sample for the birth screener and the neonatal questionnaire. Consequently, participants must have also completed the neonatal questionnaire to be eligible as a sample for the postnatal questionnaire. In order to collect information about the mothers' birth experience, breastfeeding practices and support received in the hospital, data was extracted primarily from the neonatal questionnaire.

The IFPS II used a nationally distributed consumer opinion panel of 500,000 households with a final sample of 4,902 participants (Fein et al., 2014). Its Y6FU sampling frame included all qualified participants who answered at least the first postnatal questionnaire (Fein et al., 2014). They attempted to contact 2,958 mothers and obtained 1,542 completed questionnaires. Qualifying criteria included the following: mother nor infant could have a medical condition that would affect the infant from

feeding, the infant had to have been born after 35 weeks gestation, weighed at least 5 pounds, be a singleton, and not have stayed in intensive care for more than 3 days (Fein et al., 2008).

Ordinal logistic regression analysis was conducted using IBM SPSS Statistics Version 24 University Edition to answer the following research questions:

RQ1. Is there an association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders?

$H_0$1: There is no association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders.

H_A1: There is an association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders.

RQ2. Is there an association between the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders?

$H_0$2: There is no association between any of the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders.

H_A2: There is an association between any of the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders.

Procedures for data analysis included frequencies, χ^2 tests and ordinal logistic regressions. This regression model accommodated to the ordinal dependent variable and allowed for multiple predictor variables. The use of several regression models allowed for the description of multiple outcomes. The first analysis examined individual variables (practices) by controlling for other variables. The second analysis included variables from the first model and involved demographic variables known to be linked with breastfeeding duration.

Threats to Validity

The external validity of this study is limited due to the major differences in social, cultural, and regulatory environments that influence breastfeeding behaviors in the United States. External validity can also be questioned due to the conjunction of findings from diverse clinical settings throughout the United States. Internal validity can be threatened since study findings do not include data pertaining to the first three Steps relating to hospital policies or the degrees to which hospital staff adhered to recommended practices. Measuring methods may also affect internal validity as the true nature of the results and may not have completely captured intended targeted answers. Despite these threats and limitations, study results are reasonably consistent with developed field literature and with the prior IFPS I. This establishment provides additional support to the validity of the findings.

Ethical Considerations

The IFPS II and its Y6FU were approved by the Research Involving Human Subjects Committee of the Food and Drug Administration. Respondents were given an

incentive equivalent to $10 for completing the questionnaire by telephone or by mail. All respondents were mailed informed consent which accompanied the questionnaire or were read the informed consent statements prior to the telephone interview. A signed statement of consent was not required to participate in the study.

In order to ensure moral ethical conduct, the obtained raw data will not be shared. In addition, data sets will not be released to any person other than the analysis team. Data will be stored and safeguarded from unauthorized access. These obtained data will solely be used for research purposes. All oral or written presentations of the results of the analyses will include an acknowledgment of the Nutrition Branch, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention.

Summary

Identifying primary maternity health practices that significantly increase breastfeeding duration among mothers delivering within the United States may help improve clinical health outcomes among U.S. birthing facilities. This cross-sectional design used data from the CDC's IFPS II and its Y6FU. Statistical regression helped determine the impact of studied variables and allowed for the description of multiple outcomes. Ethical procedures and proper treatment of data will safeguard the raw data obtained from the Division of Nutrition, Physical Activity, and Obesity at the United States Centers for Disease Control and Prevention.

Chapter 4 describes data collection methods and sample characteristics. Evaluations of descriptive statistics and statistical assumptions offer fundamental measurements. Statistical analysis reports of study findings are organized by research

questions and hypothesis. Tables detail study results and offer visual clarity of determined outcomes.

Chapter 4: Results

Introduction

Identifying breastfeeding-related maternity care practices that help to increase breastfeeding duration within the United States could ultimately strengthen the country's health and economic status. These identifiable breastfeeding indicators correspond to the Ten Steps to Successful Breastfeeding, the blueprint of the Baby-Friendly Initiative. Supporting research questions include:

RQ1. Is there an association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders?

$H_0$1: There is no association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders.

H_A1: There is an association between breastfeeding maternity care practices and breastfeeding duration in the United States adjusting for potential confounders.

RQ2. Is there an association between the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders?

$H_0$2: There is no association between any of the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders.

H_A2: There is an association between any of the indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful

Breastfeeding and breastfeeding duration in the United States adjusting for potential confounders.

A detailed overview of the descriptive and demographic characteristics of the sample, along with a representation of the sample is explained in this chapter. Results of preliminary data analysis, justifying the inclusion of covariates are also demonstrated in this chapter. Finally, statistical analysis findings, including probability values and confidence intervals, conclude any pertinent outcomes as they relate to the research questions and hypothesis. Findings are organized by research question and any uprising statistical tests that might emerge from the primary analysis plan are described.

Data Collection

The data, originally collected by the CDC and FDA, in partnership with other federal agencies, were used for this research. There were originally a total of 1,542 observations in the sample used to explore the association between the IFPS II and its Y6FU. The original data were collected during two separate collection periods that consisted of 2007 and 2012. After a detailed review of the data, 849 participants were removed from the original data set due to missing observations in the data. Therefore, 693 participants were used towards the final data analysis.

A vital characteristic of the sample panel members is that they all have at least moderate literacy and have experience completing questionnaires. Respondent characteristics were compared to those of the National Survey of Family Growth Cycle Six who were aged 18 – 44 during the time of their most recent singleton delivery. Members of the IFPSII sample were older, more highly educated, less likely to have low

income, more likely to be employed, more likely to be White, had fewer children, were less likely from the South, less likely to smoke, took longer maternity leave, and received first their prenatal care a bit later during pregnancy (Fein et al., 2008). In addition, breastfeeding rates were compared to those of the National Immunization Survey (NIS), a sample of women who delivered in 2004. Breastfeeding rates were as follows: never breastfeed, 26.2% (NIS) and 14.7% (IFPSII); any breastfeeding at 6 months, 41.5% (NIS) and 49.6% (IFPSII); and any breastfeeding at 12 months, 20.9% (NIS) and 25.3% (IFPSII) (Fein et al., 2008). Data showed that, on average, IFPSII mothers breastfed longer than the general population.

Results

Descriptive and demographic information was collected for each mother during the first month of delivery using the neonatal survey. All the study participants were female, ranging from 18 to 45 years of age. Participant age was categorized between 18-24, 25-34, and 35-45 years of age. The average age was between 25-34 years of age (66.4%). Most of the women were married (84.7%). Regarding race and ethnicity, most of the women were White (87.4%). In terms of education, most of the participants had received some level of college education, 36.2% attended 1-3 years of college and another 38.1% graduated from college at the bachelor level. In addition, 12.8% performed postgraduate work. Only 12.8% of the participants had received up to a high school degree. Participant income ranges from less than $19,999 (46.0%), $20,000-$49,999 (45.6%), to $50,000-$99,999 (8.4%). Complete descriptive demographic information can be found in Table 2.

Table 2

Participants' Sociodemographic Characteristics/Covariates

	N	%
Marital status		
Married	587	84.7
Not married	106	15.3
Education		
Up to high school graduate	89	12.8
1-3 years of college	251	36.2
College graduate	264	38.1
Post-graduate	89	12.8
Race and Ethnicity		
White	606	87.4
Other	87	12.6
Income		
Less than $19,999	319	46.0
$20,000 - $49,999	316	45.6
$50,000 - $99,999	58	8.4

Each covariate and independent variable was tested against the dependent variable using Crosstabs and Pearson Chi-Square tests. These tests were performed to predetermine the asymptotic significance, degrees of freedom and value of each independent variable. P-values <0.05 were deemed significant. The results of the Pearson Chi-Square analysis revealed a significant association between breastfeeding duration and age (p=.000), marital status (p=.000), education (p=.000), race (p=.043), mother enrolled in WIC (p=.000), time after delivery when mother first breastfed (p=.000), pacifier use (p=.000), baby fed formula in hospital (p=.000), and breastfeeding support info upon discharge (p=.033). I did not compute chi-square tests on variable BF Help because all participants received breastfeeding help so the variable was perceived as a constant. I concluded that there is a statistically significant association between the above-listed variables and breastfeeding duration. Therefore, both null hypotheses were rejected because there are associations between breastfeeding maternity care practices, with those corresponding to the Ten Steps to Successful Breastfeeding, and breastfeeding duration in the United States. Detailed values are illustrated in Table 3.

Table 3

Chi-Square Statistics for Covariates and Independent Variables

	Value	***df***	***sig***
Age	24.218	6	.000
Marital status	20.959	3	.000
Education	30.026	9	.000
Income	7.289	6	.295
Race/Ethnicity	8.159	3	.043
BF Class	2.380	3	.497
WIC	17.767	3	.000
BF Help	-	-	-
Hours After Delivery When Mother First Received BF Help	8.626	9	.473
Time After Delivery When Mother First BF	29.164	6	.000
Pacifier Use	33.001	3	.000
Rooming-In	6.307	6	.390
Baby Fed Formula in Hospital	64.030	3	.000
Formula in Gift Pack	2.772	6	.837
BF Support Info Upon Discharge	8.764	3	.033

The first ordinal logistic regression model controlled for demographic characteristics and was used to investigate associations between breastfeeding maternity care practices and breastfeeding duration in the United States. The predictor variables were tested a priori to verify there was no violation of the assumption of no multicollinearity. The predictor variable, time when mother first breastfed after delivery, in the ordinal logistic regression analysis was found to contribute to the model. The ordered log-odds (estimate) =-0.380, SE=0.127, Wald=8.938, p=0.003. Therefore, the longer it took mothers to breastfeed their baby after delivery, the likelihood for prolonged breastfeeding duration diminished. The predictor variable, mother enrolled in WIC, in the ordinal logistic regression analysis was also found to contribute to the model. The ordered log-odds (estimate) =0.563, SE=0.188, Wald=8.930, p=0.003. Mothers who were not enrolled in WIC during the time of delivery were more likely to have longer breastfeeding duration periods. The predictor variable, pacifier use in the hospital, in the ordinal logistic regression analysis was found to contribute to the model. The ordered log-odds (estimate) =-0.659, SE=0.159, Wald=17.245, p=0.000. Infants who were given a pacifier during their hospital stay were less likely to have prolonged breastfeeding duration periods. Finally the predictor variable, baby fed formula during the hospital stay, was also found to contribute to the model. The ordered log-odds (estimate) =-0.992, SE=0.165, Wald=36.288, p=0.000. Infants who were fed formula during their hospital stay were much less likely to have longer breastfeeding duration periods. Detailed values are illustrated in Table 4.

Table 4

Ordinal Logistic Regression Parameter Estimates: Controlling for Demographic Characteristics

					95% CI	
	Estimate	SE	Wald	p	Lower	Upper
Roomed_In	-0.02	0.094	0.045	0.831	-0.203	0.164
BFHelpHours	0.063	0.078	0.664	0.415	-0.089	0.216
TimeFirstBF	-0.38	0.127	8.938	0.003	-0.629	-0.131
Neo_WIC_Mother	0.563	0.188	8.93	0.003	0.194	0.932
BF_Class	-0.262	0.167	2.463	0.117	-0.59	0.065
Pacifier_Use	-0.659	0.159	17.245	0.000	-0.97	-0.348
Form_Gift_Pack	-0.291	0.269	1.164	0.281	-0.819	0.237
Baby_Fed_Form_Hos	-0.992	0.165	36.288	0.000	-1.315	-0.669
Hosp_Info_About_BF	0.056	0.181	0.097	0.756	-0.298	0.411

The second ordinal regression model included variables from the first model and adjusted for demographic characteristics known to be linked with breastfeeding duration. The predictor variable income was found to contribute to the model. The ordered log-odds (estimate) =-0.441, SE=0.140, Wald=9.897, p=0.002. Therefore, the higher the household income, the less likely mothers were to have longer breastfeeding durations. The predictor variable marital status was also found to contribute to the model. The ordered log-odds (estimate) =-0.595, SE=0.229, Wald=6.769, p=0.009. Mothers in this sample that were not married were less likely to have longer breastfeeding duration periods. The predictor variable education was found to contribute to the model. The

ordered log-odds (estimate) =0.274, SE=0.100, Wald=7.494, p=0.006. Mothers who received a higher education were noted to breastfeed for a longer period of time. Similar to the first regression model, the predictor variable pacifier use was found to contribute to the model. The ordered log-odds (estimate) =-0.576, SE=0.161, Wald=12.825, p=0.000. Infants who were given a pacifier during their hospital stay were less likely to have longer breastfeeding duration periods. Finally, the predictor variable baby fed formula in the hospital was once again found to contribute to the model. The ordered log-odds (estimate) =-0.938, SE=0.167, Wald=31.632, p=0.000. Infants who were fed formula during their hospital stay were much less likely to have longer breastfeeding duration periods. Detailed values are illustrated in Table 5.

Table 5

Ordinal Logistic Regression Parameter Estimates: Adjusting for Demographic Characteristics

					95% CI	
	Estimate	SE	Wald	p	Lower	Upper
Age	.251	.144	3.043	.081	-.031	.533
Race	-.315	.238	1.756	.185	-.781	.151
Income	-.441	.140	9.897	.002	-.716	-.166
Marital Status	-.595	.229	6.769	.009	-1.043	-.147
Education	.274	.100	7.494	.006	.078	.471
Roomed_In	.189	.197	.921	.337	-.197	.574
BFHelpHours	-.096	.256	.140	.708	-.597	.406
TimeFirstBF	.452	.302	2.239	.135	-.140	1.044
Neo_WIC_Mother=No	.382	.224	2.904	.088	-.057	.822
BF_Class=No	-.226	.175	1.663	.197	-.569	.117
Pacifier_Use=Yes	-.576	.161	12.825	.000	-.892	-.261
Form_Gift_Pack=No	-.351	.267	1.736	.188	-.874	.171
Baby_Fed_Form_Hos=Yes	-.938	.167	31.632	.000	-1.265	-.611
Hosp_Info_About_BF=Yes	.082	.183	.202	.653	-.276	.441

Summary

According to the findings, there are associations between breastfeeding maternity care practices and breastfeeding duration in the United States. The results noted that feeding infants formula drastically reduces the likelihood for prolonged breastfeeding duration. This finding defends The International Code of Marketing of Breast Milk Substitutes, which aims to limit the use and marketing of breast milk substitutes to patients. In addition, mothers who were enrolled in the WIC program during their neonatal stage were less likely to have extended breastfeeding duration periods. Although WIC programs provide substantial breastfeeding assistance nationwide, this could be a result of formula distributions.

Findings also indicated associations between several indicators of breastfeeding maternity care practices that correspond to the Ten Steps to Successful Breastfeeding and breastfeeding duration in the United States. Study outcomes noted that mothers who breastfed sooner after delivery were more likely to have longer breastfeeding duration terms. This finding runs parallel to Step 4 of the Ten Steps to Successful Breastfeeding which recommends maternity staff to help mothers initiate breastfeeding within one hour of birth. In addition, study findings concluded that offering a pacifier to infants during their hospital stay reduces the length of breastfeeding duration. This finding justifies Step 9 of Ten Steps to Successful Breastfeeding which states, give no pacifiers or artificial nipples to breastfeeding infants.

Chapter 5 discusses findings of the study as they are confirmed, disconfirmed or extend knowledge in the discipline by comparing them to what has been found in the

peer-reviewed literature. Outcomes were also analyzed and interpreted in the context of the theoretical framework. Limitations of generalizability, trustworthiness, validity, and reliability that arose from the execution of the study were exposed in Chapter 5. Grounded recommendations for further research are clarified, considering their strengths and limitations. Finally, implications for positive social change at appropriate levels are detailed.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to assess which health practices most significantly impact breastfeeding duration in the United States. Measuring breastfeeding practices along with consequential breastfeeding duration experienced by families within U.S. birthing facilities can help determine primary breastfeeding indicators that strengthen breastfeeding duration among breastfeeding mothers in the United States. Several breastfeeding practice indicators that correspond to the Ten Steps to Successful Breastfeeding were used for the purpose of this study. They include prenatal breastfeeding education (Step 3), early initiation of breastfeeding (Step 4), teaching breastfeeding techniques (Step 5), limited supplementation of breastfeeding infants (Step 6), rooming-in (Step 7), teaching feeding cues (Step 8), limited use of pacifiers (Step 9), and postdischarge support (Step 10) (Baby-Friendly USA, 2016). In addition, the study indicator corresponding to The International Code of Marketing of Breast Milk Substitutes included the variable of distribution of a gift pack containing formula.

These indicators were all set as independent variables and were sited parallel to the extent of breastfeeding duration. Chi-square tests and statistical regression models measured strengths in relationships among these independent variables and the dependent variable. Parallel to the research in the discipline, study findings revealed associations among breastfeeding maternity care practices corresponding to the Ten Steps to Successful Breastfeeding and The International Code of Marketing of Breast Milk Substitutes and breastfeeding duration within the United States (Perez-Escamilla et al.,

2016). According to the literature, particular steps are associated with shorter breastfeeding durations (Nickel et al., 2013). The absence of Step 6: give infants no food or drink other than breast milk unless medically indicated, is directly related to shorter breastfeeding durations (Nickel et al., 2013; Perrine, Scanlon, Li, Odom, & Grummer-Strawn, 2012). In addition, researchers concluded that the combined absence of Step 4: help mothers initiate breastfeeding within 1 hour of birth, and Step 9: give no pacifiers or artificial nipples to breastfeeding infants, are associated with the strongest decrease in breastfeeding duration (Nickel et al., 2013).

Outcomes revealed that feeding infants any formula during their hospital stay drastically reduces the likelihood for prolonged breastfeeding duration. This finding defends The International Code of Marketing of Breast Milk Substitutes which aims to limit the use and marketing of breast milk substitutes to patients. Another outcome concluded that mothers who were enrolled in the WIC program during their neonatal stage were less likely to have extended breastfeeding duration periods. Findings also indicated that mothers who breastfed sooner after delivery were more likely to have longer breastfeeding duration periods. This finding runs parallel to Step 4 of the Ten Steps to Successful Breastfeeding which recommends maternity staff to help mothers initiate breastfeeding within 1 hour of birth. Lastly, outcomes concluded that offering a pacifier to infants during their hospital stay reduces the length of breastfeeding duration. This finding justifies Step 9 of Ten Steps to Successful Breastfeeding which states give no pacifiers or artificial nipples to breastfeeding infants.

Interpretation of the Findings

Demographic characteristics such as age, marital status, education, income, and race have been found to influence breastfeeding rates and durations in the United States (Nnebe-Agumadu, Racine, Laditka, & Coffman, 2016; Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013). Although chi-square tests determined that maternal ages (p=.000) between 25-34 years of age tended to have longer breastfeeding durations compared to those aged 18-24 or 35-45, the second ordinal regression did not find age to be a significant influence on breastfeeding duration (p=.081). Marital status (p=.009) also depicted a strong association with breastfeeding duration. The second ordinal regression confirmed that married women tend to have longer breastfeeding durations than unmarried women. These findings are congruent with other studies which found unmarried women to have shorter breastfeeding duration periods in the postpartum term (Odom et al., 2013). Maternal education (p=.006) also resulted in an association with breastfeeding duration. Women who were college graduates had longer breastfeeding durations than those with fewer years of education. Although income generally runs parallel to education, this study concluded that there is not an association between a higher income and breastfeeding duration (p=.295). Women who held higher household income levels did not have longer breastfeeding duration terms. Women who held higher income levels concluded to have lower breastfeeding duration periods. These findings compare to the literature, which did not find household income to be significant when measuring breastfeeding duration lengths (Odom et al., 2013). Chi-square tests did determine race to be a significant factor with breastfeeding duration (p=.043), but the

second ordinal regression did not find race to be significant (p=.185). In accordance with the literature in the disciple and the results of this study, women who classified themselves as White held longer breastfeeding durations than those who declared themselves as non-White (Nnebe-Agumadu et al., 2016; Odom et al., 2013).

Research Question 1

Although several studies have identified positive associations among mothers with greater exposure to WIC services and breastfeeding duration lengths (McCoy, Geppert, Dech, & Richardson, 2018; Metallinos-Katsaras, Brown, & Colchamiro, 2015), chi-square tests demonstrated a negative association with breastfeeding durations (p=.000). The first ordinal regression model also significantly (p=.003) deemed mothers who were not enrolled in the WIC program to have longer breastfeeding durations. Women who were not enrolled in the WIC program during their neonatal stage had longer breastfeeding duration periods than those enrolled in the program. Step 6 of the Ten Steps to Successful Breastfeeding abides by The International Code of Marketing of Breast Milk Substitutes which recommended not to give infants food or drink other than breast milk, unless medically indicated (WHO, 2009). Chi-square tests (p=.000) and ordinal regression models (p=.000) confirmed this knowledge in the discipline (see Perrine et al., 2012). Outcomes revealed that mothers who fed their infant's formula during their hospital stay significantly reduced their breastfeeding duration. The International Code of Marketing of Breast Milk Substitutes also discourages the distribution of infant formula samples inside hospital gift packs (WHO, 2009). Chi-square tests (p=.837) and regression models (p=.281) revealed no associations between

the acceptance of gift packs including formula samples and breastfeeding duration periods. This outcome does not support the recommended practice of eliminating the distribution of discharge gift packs containing infant formula (Olaiya, 2016; Pounds & Shostrom, 2018).

Research Question 2

Step 3 of the Ten Steps to Successful Breastfeeding states to inform all pregnant women about the benefits and management of breastfeeding (WHO, 1998). This step includes the participation of a breastfeeding class for all women who intend to breastfeed (WHO, 1998). Research has shown that breastfeeding intervention strategies include a prenatal breastfeeding class in the attempt to increase breastfeeding initiation and duration (Leiter, Naegeli, & Walkley, 2018). Chi-square tests (p=.497) and ordinal regression models (p=.117) for this study did not demonstrate a direct association with the attendance of a breastfeeding class and breastfeeding duration. Parameter estimates did show that women who did not attend a breastfeeding class during pregnancy held shorter lengths of breastfeeding durations than those women who did attend a breastfeeding class.

Step 5 of the Ten Steps to Successful Breastfeeding states: Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants. Chi-Squares Tests and regressions were not able to run in SPSS since frequencies showed that all women stated to receive some level of breastfeeding help during their hospital stay after delivery. These numbers showed a significant increase in breastfeeding awareness and encouragement from staff working within United States birthing facilities.

Alongside Step 5, Step 4 states: Help mothers initiate breastfeeding within one hour of birth. Although breastfeeding assistance soon after birth is a recommended practice in the discipline of breastfeeding, the results of Chi-Square Tests (p=.473) and ordinal regression models (p=.708) did not show a significant association with breastfeeding duration. Interestingly, the time in which mothers first breastfed were significant under the Chi-Square tests (p=.000) and first regression model (p=.003). Mothers who breastfed their children within one hour after birth had extended breastfeeding durations compared to those mothers who took longer to breastfeed. Mothers who took longer to initially breastfeed their infant held shorter breastfeeding duration periods. These findings are comparable with those of other studies that found breastfeeding within one hour after birth to have a positive association with breastfeeding duration periods (Munn et al., 2016; Olaiya et al., 2016).

Step 9 of the Ten Steps to Successful Breastfeeding states: Give no pacifiers or artificial nipples to breastfeeding infants. Outcomes of the Chi-Square Tests (p=.000) and ordinal regression models (p=.000) confirmed this knowledge in the discipline (Smith et al., 2012). Infants who used a pacifier during their hospital stay were less likely to have prolonged breastfeeding durations. Step 7 states: Practice rooming-in – allow mothers and infants to remain together 24 hours a day. Chi-Square outcomes (p=.390) and ordinal regression models (p=.831) did not validate the research behind this practice. Although most mothers in this study did room-in with their infants 24/7, this practice did not influence breastfeeding durations. Step 10 of the Ten Steps to Successful Breastfeeding states: Foster the establishment of breastfeeding support groups and refer

mothers to them on discharge from the hospital or birth center. Although Chi-Square Tests did confirm (p=.033) that mothers who received information about community breastfeeding support had increased breastfeeding durations, ordinal regression models did not confirm this practice to influence extended breastfeeding duration periods (*p*=.756).

Limitations of the Study

Data obtained from The IFPS II and its Y6FU were collected from maternal recall when infants were about three weeks of age. Although self-reporting is one of the few pragmatic mechanisms in collecting breastfeeding outcomes, this method of data collection may lead to potential uncontrolled recall bias. A randomized selection of study participants was constructed using a nationally distributed consumer opinion panel. This selection was preferred over a self-selection method in the attempt to decrease underestimations or overestimations in the data based on the social desirability of the breastfeeding health behavior. In addition, individual state breastfeeding results were not considered and populations were not categorized by distinct demographic locations in order to decrease the generalizability of educational levels, income and social and cultural norms. Although neither the IFPS II nor the Y6FU sample is nationally representative, members of the IFPSII sample were older, more highly educated, less likely to have low income, more likely to be employed, more likely to be white, had fewer children, were less likely from the South, less likely to smoke, took longer maternity leave, received their first prenatal care a bit later during pregnancy and breastfed longer than the general population (Fein et al., 2008). Sample evaluations

confirmed that Y6FU mothers were more likely to be white, married, older and of higher education when compared to non-respondents and nationally representative mothers (Fein et al., 2014).

The original data sample, originally collected by The Centers for Disease Control and Prevention and the Food and Drug Administration (FDA), in partnership with other federal agencies, totaled 1,542 observations. After a detailed review of the data, 849 participants were removed from the original data set due to missing observations in the data set. Due to the construction of the participant questionnaire, the exclusion of variables led to discrepancies and missing data in the observed variables. Seeking only the inclusion of participants who had no missing data in all the observed variables, participants who encompassed missing data in the observed variables were deleted from the data analysis. Therefore, a total of 693 participants were used towards the final data analysis.

Recommendations

As maternity health professionals continue to address recommendations set forth by the Healthy People 2020 objectives, The Ten Steps to Successful Breastfeeding and the International Code of Marketing of Breast Milk Substitutes, results concluded from this study will add additional information and resources to better provide services to families across the United States. Recommendations for action include the development of breastfeeding education by presenting this information to Baby-Friendly, USA, the International Lactation Consultant Association, nursing and medical schools, and birthing facilities across the United States.

Recommendations for additional research include further review of the areas of this study that were not significant and their validation for recommended health practices. Although the Ten Steps to Successful Breastfeeding is a strong blueprint for maternity practice, health professionals should concentrate their efforts on the practices that are deemed significant. In addition, further research should help determine the reason for which WIC mothers have lower breastfeeding durations. The United States WIC program employs lactation consultants and peer counselors to assist mothers with breastfeeding needs free of charge to the family. Further investigation of this phenomenon will aid to improve breastfeeding health outcomes for the many families that are enrolled in the WIC Program.

Implications for Social Change

Breastfeeding is widely recognized as the optimal feeding method for the mother-baby dyad (World Health Organization, 2016; American Academy of Pediatrics, 2012). Enhancing the knowledge and practice in the discipline of breastfeeding is extensively considered an imperative public health strategy (Centers for Disease Control and Prevention, 2013). This study confirms and disconfirms many of the primary breastfeeding practices that are at the frontline of maternity patient care in the United States. The results of this study could be used to inform policy decision makers, medical professionals and families on the lasting benefits of breastfeeding. As the continual practice of breastfeeding also results in cost savings for parents, insurers, employers and society, the economic status of the United States is due to improve as more families breastfeed their young (Bartick, 2011). Establishing well-grounded practices that aid in

the long-term duration of breastfeeding could help save lives and improve child and maternal health outcomes in the United States.

Conclusion

Although breastfeeding is recommended for the first year of life, most families do not breastfeed their young for the recommended length of time. The results of this study demonstrate the effects of recommended breastfeeding health practices on breastfeeding duration in the United States. Many practices confirmed their positive influence on the duration of breastfeeding, but few did not confirm the knowledge in the literature. Establishing necessary breastfeeding practices will aid medical professionals working in maternity as well as their breastfeeding families. Concentrating on the practices that enhance breastfeeding outcomes will also improve the overall health and economic status of the United States.

References

Ajzen, I. (1991). The Theory of Planned Behaviour. Organizational Behaviour and Human Processes, *50*(2), 179-211. doi:10.1016/0749-5978(91)90020-T

American Academy of Pediatrics. (2012). Section on breastfeeding: Breastfeeding and the use of human milk. *Pediatrics, 129*(3), e827-41. doi:10.1542/peds.2011-3552

Baby-Friendly USA. (2012). Baby-Friendly hospital initiative. Retrieved from https://www.babyfriendlyusa.org/about-us/baby-friendly-hospital-initiative

Baby-Friendly USA. (2016). Designated facilities by state. Retrieved from https://www.babyfriendlyusa.org/find-facilities

Barnes, M., Cox, J., Doyle, B. & Reed, R. (2010). Evaluation of a practice-development initiative to improve breastfeeding rates. *Journal of Perinatal Education, 19*(4), 17-23. doi:10.1624/105812410X530893

Bartick, M. (2011). Breastfeeding and the U.S. economy. *Breastfeeding Medicine, 6*(5), 313-318. doi:10.1089/bfm.2011.0057

Battersby, S. (2014). The role of the midwife in breastfeeding: Dichotomies and dissonance. *British Journal of Midwifery, 22*(8), 551–6. https://doi.org/10.12968/bjom.2014.22.8.551

Beake, S., Pellowe, C., Dykes, F., Schmied, V., & Bick, D. (2012). A systematic review of structured versus non-structured breastfeeding programs to support the initiation and duration of exclusive breastfeeding in acute and primary healthcare settings. *Maternal and Child Nutrition, 8*(2), 141-161. doi:10.1111/j.1740-8709.2011.00381.x

Brewer, T. L. (2012). Pediatric nurses' knowledge and attitudes regarding the provision of breastfeeding support in a pediatric medical center. *Clinical Lactation, 3*(2), 64–68. doi:10.1891/215805312807009397

Cabieses, B., Waiblinger, D., Santorelli, G., & McEachan, R. (2014). What factors explain pregnant women's feeding intentions in Bradford, England: A multi-methods, multi-ethnic study. *BMC Pregnancy and Childbirth, 14*(1), 50. doi:10.1186/1471-2393-14-50

Centers for Disease Control and Prevention. (2015a). National survey of maternity practices in infant nutrition and care. Retrieved from http://www.cdc.gov/breastfeeding/data/mpinc/index.htm

Centers for Disease Control and Prevention. (2015b). The CDC Guide to Breastfeeding Interventions. Retrieved from https://www.cdc.gov/breastfeeding/pdf/breastfeeding_interventions.pdf

Centers for Disease Control and Prevention. (2016). Breastfeeding report cards. Retrieved from http://www.cdc.gov/breastfeeding/data/reportcard.htm

Chabot, G & Lacombe, M. (2014). Factors influencing the intention of perinatal nurses to adopt the Baby-Friendly Hospital Initiative in Southeastern Quebec, Canada: Implications for practice. *Nursing Research and Practice, 2014,* 1-8. https://doi.org/10.1155/2014/603964

Chung, M., Raman, G., Trikalinos, T., Lau, J., & Ip, S. (2008). Interventions in primary care to promote breastfeeding: An evidence review for the U.S. Preventive Services Task Force. *Annals of Internal Medicine, 149*(8), 565-582. Retrieved

from http://annals.org/article.aspx?articleid=743317

Daneault, S., Beaudry, M., & Godin, G. (2004). Psychosocial determinants of the intention of nurses and dietitians to recommend breastfeeding. *Canadian Journal of Public Health, 95*(2), 151-154. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/15074909

DelliFraine, J., Langabeer, J., Delgado, R., Williams, J.F. & Gong, A. (2013). A transition strategy for becoming a baby-friendly hospital: Exploring the costs, benefits, and challenges. *Breastfeeding Medicine, 8*, 170–75. doi:10.1089/bfm.2012.0050

Dieterich, C., Felice, J., O'Sullivan, E. & Rasmussen, K. (2013). Breastfeeding and health outcomes for the mother-infant dyad. *Pediatric Clinics of North America, 60*(1), 31-48. doi:10.1016/j.pcl.2012.09.010

Eccles, M.P., Hrisos, S., Francis, J., Kaner, E., Dickinson, H., Beyer, F. & Johnston, M. (2006). Do self-reported intentions predict clinicians' behavior: A systematic review. *Implementation Science*, *1*(1), 28. doi:10.1186/1748-5908-1-28

Fein, S., Labiner-Wolfe, J., Shealy, K., Li, R., Chen, J. & Grummer-Strawn, L. (2008). Infant Feeding Practices Study II: Study methods. *Pediatrics, 122*(2), S28-S35. Retrieved from http://pediatrics.aappublications.org/content/pediatrics/122/Supplement_2/S28.full.pdf

Fein, S., Li, R., Chen, J., Scanlon, K., & Grummer-Strawn, L. (2014). Methods for the Year 6 Follow-Up study of children in the Infant Feeding Practices Study II. *Pediatrics, 134*(1), S4-S12. doi:10.1542/peds.2014-0646C

Geraghty, S. & Rasmussen, K. (2010). Redefining "breastfeeding" initiation and duration in the age of breastmilk pumping. *Breastfeed Medicine, 5*(3), 135-137. doi:10.1089/bfm.2009.0094

Godin, G., Bélanger-Gravel, A., Eccles, M. & Grimshaw, J. (2008). Healthcare professionals' intentions and behaviors: A systematic review of studies based on social cognitive theories. *Implementation Science, 3*(1), 36. doi: 10.1186/1748-5908-3-36

Hamilton, K., Daniels, L., White, K.M., Murray, N., & Walsh A. (2011). Predicting mothers' decisions to introduce complementary feeding at 6 months. An investigation using an extended theory of planned behavior. *Appetite, 56*(3), 674-681. doi:10.1016/j.appet.2011.02.002

Hamilton, B.E., Martin, J.A., & Ventura, S.J. (2009). Births: Preliminary data for 2007. *National Vital Statistics Reports, 57*(12), 1-17. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr57/nvsr57_12.pdf

Heymann, J., Raub, A., & Earle, A. (2013). Breastfeeding policy: A globally comparative analysis. *Bulletin of the World Health Organization, 91,* 398-406. doi:10.2471/BLT.12.109363

Johnson, D.B., Lamson, E., Schwartz, R., Goldhammer, C. & Ellings, A. (2015). A community health clinic breastfeeding-friendly pilot: What can we learn about the policy process? *Journal of Human Lactation, 31*(4), 660-670. doi:10.1177/0890334415579656

King, M. & Bruner, G. (2000). Social desirability bias: A neglected aspect of validity testing. *Psychology & Marketing, 17*(2), 79-103. https://doi.org/10.1002/(SICI)1520-6793(200002)17:2<79::AID-MAR2>3.0.CO;2-0

Lawton, R., Ashley, L., Dawson, S., Waiblinger, D., & Conner, M. (2012). Employing an extended Theory of Planned Behaviour to predict breastfeeding intention, initiation, and maintenance in White British and South-Asian mothers living in Bradford. *British Journal of Health Psychology, 17*(4), 854–871. doi:10.1111/j.2044-8287.2012.02083.x

Leiter, J., Naegeli, J. & Walkley, L. (2018). The effect of lactation consultation on the duration of breastfeeding in new mothers: A systematic review. *Honors Research Projects,* 720. Retrieved from https://ideaexchange.uakron.edu/cgi/viewcontent.cgi?article=1662&context=honors_research_projects

McCoy, M., Geppert, J., Dech, L. & Richardson, M. (2018). Associations between peer counseling and breastfeeding initiation and duration: An analysis of Minnesota participants in the special supplemental nutrition program for women, infants, and children (WIC). *Maternal and Child Health Journal, 22*(1), 71-81.

doi:10.1007/s10995-017-2356-2

McEachan, R., Conner, M., & Taylor, N. (2011). Prospective prediction of health-related behaviors with The Theory of Planned Behaviour: A meta-analysis. *Health Psychology Review, 5*(2), 44-97. doi:10.1080/17437199.2010.521684

McMillan, B., Conner, M., Woolridge, M., Dyson, L., Green, J., Renfrew, M., Bharj, K. & Clarke, G. (2008). Predicting breastfeeding in women living in areas of economic hardship: Explanatory role of the theory of planned behavior. *Psychology & Health, 23*(7), 767-88. doi:10.1080/08870440701615260

Metallinos-Katsaras, E., Brown, L., & Colchamiro, R. (2015). Maternal WIC participation improves breastfeeding rates: A statewide analysis of WIC participants. *Maternal and Child Health Journal, 19*(1), 136-143. doi:10.1007/s10995-014-1504-1

Munn, A.C., Newman, S.D., Mueller, M., Phillips, S.M., & Taylor, S.N. (2016). The impact in the United States of the Baby-Friendly hospital initiative on early infant health and breastfeeding outcomes. *Breastfeeding Medicine*, *11*(5), 222-230. doi:10.1089/bfm.2015/0135

Nickel, N.C., Labbok, M.H., Hudgens, M.G. & Daniels, J.L. (2013). The Extent that noncompliance with the Ten Steps to Successful Breastfeeding influences breastfeeding duration. *Journal of Human Lactation, 29*(1), 59-70. doi:10.1177/0890334412464695

Nnebe-Agumadu, U., Racine, E., Laditka, S., & Coffman, M. (2016). Associations between perceived value of exclusive breastfeeding among pregnant women in

the United States and exclusive breastfeeding to three and six months postpartum; a prospective study. *International Breastfeeding Journal, 11*(8), 1-10. doi:10.1186/s13006-016-0065-x

Odom, E.C., Li, R., Scanlon, K.S., Perrine, C.G., & Grummer-Strawn, L. (2013). Reasons for earlier than desired cessation of breastfeeding. *Pediatrics, 131*(3), e726–e732. doi:10.1542/peds.2012-1295

Office of the Surgeon General. (2011). The Surgeon General's call to action to support breastfeeding. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21452448

O'Sullivan, A., Farver, M., & Smilowitz, J. (2015). The Influence of Early Infant-Feeding Practices on the Intestinal Microbiome and Body Composition in Infants. *Nutrition and Metabolic Insights, 8*(1), 87. doi:10.4137/NMI.S41125

Perez-Escamilla, R. (2012). Breastfeeding social marketing: Lessons learned from USDA's "Loving Support" campaign. *Breastfeeding Medicine, 7*(5), 358–63. doi:10.1089/bfm.2012.0063

Perez-Escamilla, R. & Chapman, D.J. (2012). Breastfeeding protection, promotion, and support in the United States: A time to nudge, a time to measure. *Journal of Human Lactation, 28*(2), 118–21. doi:10.1177/0890334412436721

Perez-Escamilla, R., Martinez, J., & Segura-Perez, S. (2016). Impact of the Baby-Friendly Hospital Initiative on breastfeeding and child health outcomes: A systematic review. *Maternal and Child Nutrition Journal, 12*(3), 402-417. doi:10.1111/mcn.12294

Perkins, M.B., Jensen, P.S., Jaccard, J., Gollwitzer, P., Oettingen, G., Pappadopulos, E. & Hoagwood, K.E. (2007). Applying theory-driven approaches to understanding and modifying clinicians' behavior: What do we know? *Psychiatric Services, 58*(3), 342–348. doi:10.1176/ps.2007.58.3.342

Perrine, C.G., Scanlon, K.S., Li, R., Odom, E., & Grummer-Strawn, L.M. (2012). Baby-Friendly hospital practices and meeting exclusive breastfeeding intention. *Pediatrics, 130*(1), 54-60. doi:10.1542/peds.2011-3633

Pounds, L. & Shostrom, V. (2018). Analyzing factors that impact breastfeeding duration in the postpartum period: A secondary analysis of PRAMS data. *Breastfeeding Medicine, 13*(5), 335-340. doi:10.1089/bfm.2018.0020

Rashidian, A., Miles, J., Russell, D., & Russell, I. (2006). Sample size for regression analyses of theory of planned behavior studies: Case of prescribing in general practice. *British Journal of Health Psychology, 11*(4), 581–593. doi:10.1348/135910705X66043

Schwarzer, R. (2008). Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Applied Psychology, 57*(1), 1–29. https://doi.org/10.1111/j.1464-0597.2007.00325.x

Semenic, S., Childerhose, J., Lauziere, J., & Groleau, D. (2012). Barriers, facilitators, and recommendations related to implementing the baby-friendly initiative: An integrated review. *Journal of Human Lactation, 28*(3), 317-334. doi:10.1177/0890334412445195

Simkin, P., Bolding, A., Keppler, A., Durham, J., & Whalley, J. (2010). *Pregnancy, Childbirth, and the Newborn (4th Edition): The Complete Guide*. Minneronka, MN: Meadowbrook Press.

Smith, P.B., Moore, K., & Peters, L. (2012). Implementing baby-friendly practices: Strategies for success. *The American Journal of Maternal-Child Nursing, 37*(4), 228-233. doi:10.1097/NMC.0b013e318251054e

Triandis, H.C. (1980). Values, attitudes, and interpersonal behavior. *Nebraska Symposium on Motivation: Beliefs, Attitudes and Values, 27*, 195–259. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/7242748

UNICEF & World Health Organization. (2009). BFHI Section 3**:** Breastfeeding Promotion and Support in a Baby-Friendly Hospital**.** Retrieved from http://www.who.int/nutrition/publications/infantfeeding/bfhi_trainingcourse_s3/en/

U.S. Department of Health and Human Services. (2011*). The Surgeon General's Call to Action to Support Breastfeeding.* Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General.

Varaei, S., Mehrdad, N., & Bahrani, N. (2009). The relationship between self-efficacy and breastfeeding, Tehran, Iran. *Hayat Journal of Faculty of Nursing & Midwifery, 15*(3), 77-77. Retrieved from http://hayat.tums.ac.ir/article-1-111-en.pdf

Venancio, S.I., Saldiva, S.R., Escuder, M.M. & Giugliani, E.R. (2012). The Baby-Friendly Hospital Initiative shows positive effects on breastfeeding

indicators in Brazil. *Journal of Epidemiology & Community Health, 66*(10), 914–8. doi:10.1136/jech-2011-200332

Walsh, D., Pincombe, J. & Henderson. (2011). An examination of maternity staff attitudes towards implementing Baby Friendly Health Initiative (BFHI) Accreditation in Australia. *Maternal and Child Health Journal, 15*(5), 597-609. doi:10.1007/s10995-010-0628-1

World Health Organization. (1998). Evidence for the ten steps to successful breastfeeding. Retrieved from http://apps.who.int/iris/bitstream/10665/43633/1/9241591544_eng.pdf

World Health Organization. (2002). Infant and young child nutrition: Global strategy on infant and young child feeding. Retrieved from http://apps.who.int/gb/archive/pdf_files/WHA55/ea5515.pdf?ua=1

World Health Organization. (2003). Special supplement of the Food and Nutrient Bulletin based on a WHO expert consultation on complementary feeding. *Food and Nutrition Bulletin, (24)*1. Retrieved from https://www.who.int/maternal_child_adolescent/documents/fnb_24_1/en/

World Health Organization. (2009). Baby-Friendly Hospital Initiative: Revised, Updated and Expanded for Integrated Care. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/23926623

World Health Organization. (2009). International Code of Marketing of Breast Milk Substitutes. World Health Organization, Geneva, Switzterland. Retrieved from https://www.who.int/nutrition/publications/code_english.pdf

World Health Organization. (2014). Global Nutrition Targets 2025: Breastfeeding Policy Brief. Retrieved from https://www.who.int/nutrition/publications/globaltargets2025_policybrief_breastfeeding/en/

World Health Organization. (2016). Exclusive breastfeeding. Retrieved from http://www.who.int/nutrition/topics/exclusive_breastfeeding/en/